

Prediction of difficult venous access in adults: an analysis of available scales and a proposal for implementation in clinical practice in the Czech Republic

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Objective: Difficult peripheral intravenous access (DIVA) affects a substantial proportion of the adult population and presents challenges for both patients and healthcare staff. In the Czech Republic, no validated predictive tools for identifying DIVA are currently available. The aim of this study was to identify available prediction scales, compare their characteristics, and assess the feasibility of their implementation in clinical practice.

Methods: This study is a combined methodological analysis conducted in two phases: (1) systematic identification and selection of DIVA prediction scales (Web of Science and Scopus databases) and (2) expert evaluation of the selected tools by a clinical expert panel. The panel assessed the content and clinical relevance of the scales, their feasibility, degree of subjectivity, and potential contribution to practice.

Results: The analysis included the following predictive tools: A-DIVA, SAFE Rule, A-DICAVE, EA-DIVA, and DIVA-CP. According to current evidence, the first three scales appear most suitable for a broad adult population. A-DIVA demonstrates good predictive value and external validity, but focuses primarily on first-attempt cannulation failure. The SAFE Rule is a simple screening rule based on the most common DIVA predictors, but lacks formal scoring and risk stratification. A-DICAVE is a fast three-item tool suitable particularly for emergency departments, although it has only been internally validated.

Conclusion: Although no universal predictive instrument exists, the available tools provide an effective framework for identifying high-risk patients and optimizing cannulation techniques. For Czech healthcare, translation and validation studies of the most promising tools for the general adult population (A-DIVA, SAFE Rule, A-DICAVE) and for the oncology population (DIVA-CP) are essential, along with the development of standardized care algorithms that prioritize ultrasound guidance and limit “blind” attempts.

Key words: DIVA (Difficult Intravenous Access), implementation in clinical practice, peripheral venous cannulation, prediction scales, ultrasound guidance.

Introduction

Changes in the demographic and clinical profile of the contemporary population are fundamentally transforming the landscape of healthcare. With increasing life expectancy and the growing prevalence of chronic diseases, the number of patients requiring repeated blood sampling, hospitalizations, infusion therapy, parenteral nutrition, intravenous administration of medications and blood products, as well as other diagnostic and therapeutic procedures, continues to rise. Primary care is becoming increasingly professionalized, providing a broader range of services in both outpatient and home settings.

This trend consequently underscores the need to ensure high-quality vascular access [1, 2].

The number of patients in whom it is difficult to establish reliable peripheral intravascular access is steadily increasing (affecting 30–60% of the adult population). DIVA (Difficult Intravenous Access) refers to patients in whom the insertion of a venous catheter using standard techniques proves very difficult. These patients belong to all age groups and typically present with peripheral veins that are visible but inadequate, or entirely non-visible and non-palpable. Individuals in whom only one upper limb can be cannulated also constitute an at-risk